CLAIMS

I CLAIM:

1. A method of measuring the FM profile of a work signal, the method comprising the steps of:

(a) comparing, at a regular rate of at least once per cycle of the work signal, the work signal against a threshold to produce a first sequence of logical values whose transitions from one logical value to another correspond to half the period of the work signal, the threshold being set at essentially the midpoint of the work signal's excursion;

(b) storing the first sequence of logical values;

(c) computationally heterodyning the signal represented by the first sequence of logical values stored in step (b) by construing those logical values as corresponding numeric ones and zeros and producing a second sequence of numeric values that represents a spectrum including upper and lower sidebands, the lower sideband approaching but not passing through DC;

(d) digitally filtering the second sequence of numeric values to remove the upper sideband and produce a third sequence of numerical values including consecutive time variant original sine values of the lower sideband;

(e) differentiating the consecutive time variant original sine values of the third sequence to form a fourth sequence of derived cosine values whose successive members are the differences between each original sine value of the third sequence and its successor original sine value in the third sequence;

(f) assuming the existence of an all-zero fifth sequence of original cosine values corresponding to the original sine values of the third sequence, and also the existence of an all-zero sixth sequence of derived sine values corresponding to the fourth sequence of derived cosine values;

(g) computationally extracting phase information from the third, fourth, fifth and sixth sequences to produce a seventh sequence of numerical values representing change in phase as a function of time;

(h) digitally filtering the seventh sequence to produce an eighth sequence of numerical values

representing change in frequency as a function of time; and

(i) inspecting the numerical values in the eighth sequence to ascertain the minimum and maximum frequencies.

2. A method as in claim 1 wherein the work signal is a spread spectrum clock signal.

3. A method as in claim 1 wherein the regular rate of step (a) is less than the Nyquist sampling rate for the work signal.

4. A method of measuring the FM profile of a work signal, the method comprising the steps of:

(a) comparing, at a regular rate of at least twice per cycle of the work signal, the work signal against a threshold to produce a first sequence of logical values whose transitions from one logical value to another correspond to half the period of the work signal, the threshold being set at essentially the midpoint of the work signal's excursion;

(b) storing the first sequence of logical values;

(c) computationally heterodyning the signal represented by the first sequence of logical values stored in step (b) by construing those logical values as corresponding ones and zeros and producing a second sequence of numeric values that represents a spectrum including upper and lower sidebands, the lower sideband approaching but not passing through DC;

(d) digitally filtering the second sequence of logical values to remove the upper sideband and produce a third sequence of numerical values of consecutive time variant original sine values and a fifth sequence of numerical values of consecutive time variant original cosine values, each for the lower sideband;

(e) differentiating the consecutive time variant original sine values of the third sequence to form a fourth sequence of derived cosine values whose successive members are the differences between each original sine value of the third sequence and its successor original sine value in the third sequence;

(f) differentiating the consecutive time variant original sine values of the fifth sequence to form a sixth sequence of derived sine values whose successive members are the differences

between each original cosine value of the fifth sequence and its successor original cosine value in the fifth sequence;

(g) computationally extracting phase information from the third, fourth, fifth and sixth sequences to produce a seventh sequence of numerical values representing change in phase as a function of time;

(h) digitally filtering the seventh sequence to produce an eighth sequence of numerical values representing change in frequency as a function of time; and

(i) inspecting the numerical values in the eighth sequence to ascertain the minimum and maximum frequencies.

5. A method as in claim 4 wherein the work signal is a spread spectrum clock signal.